

EARTHQUAKE COUNTS FROM DETECTED EVENTS

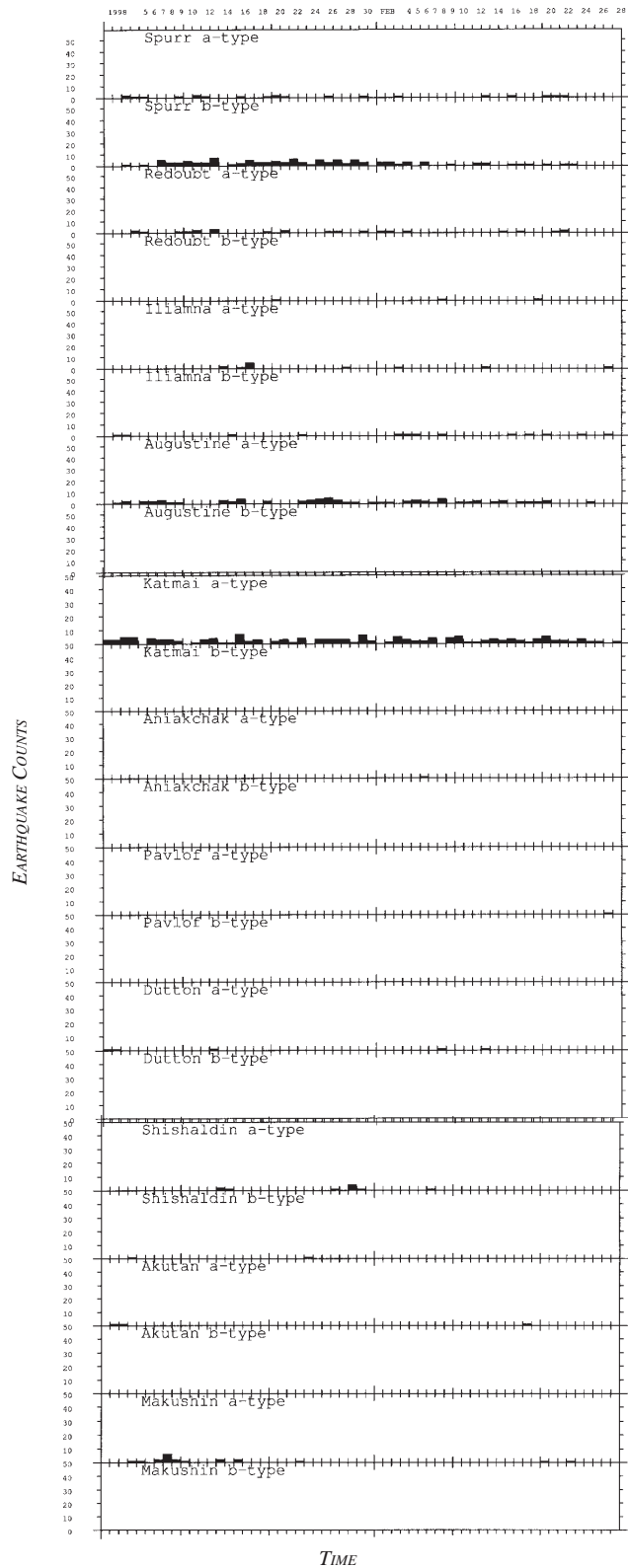


Figure 14a: Histogram of computed detected ("Willie system") seismic events during January through February.

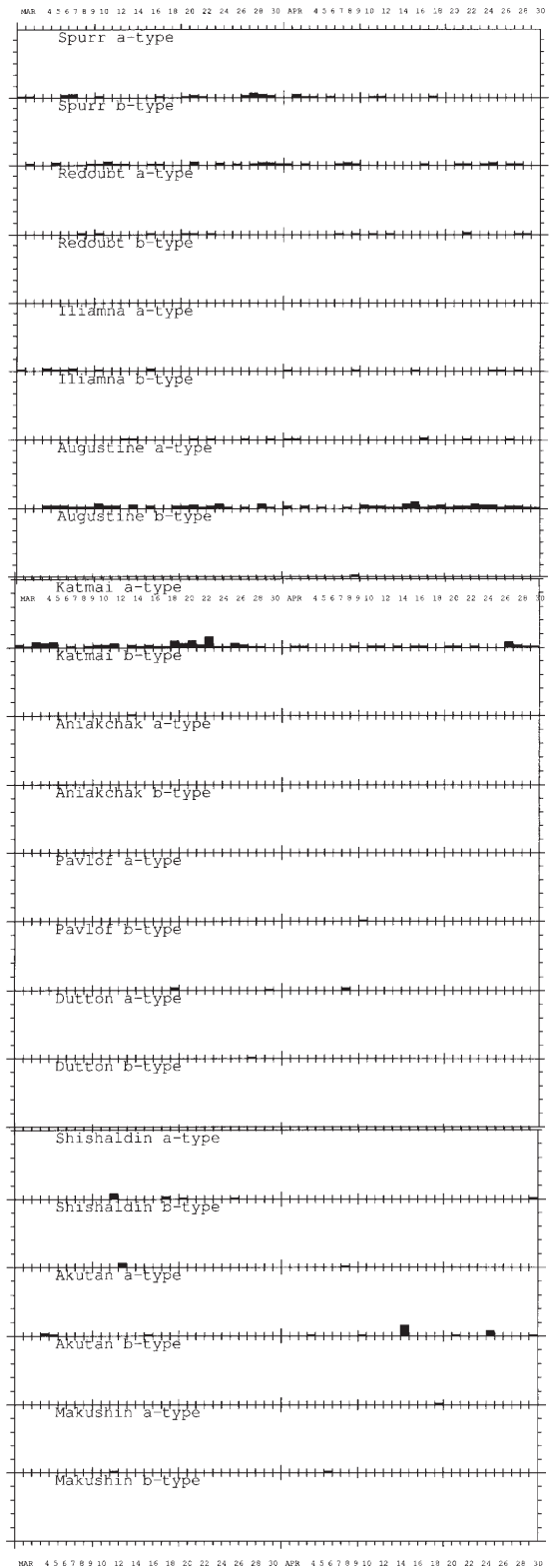


Figure 14b: Histogram of computed detected ("Willie system") seismic events during March through April.

Observed Mean Seismicity Rates - 1997 Edition

The close of 1997 marked the accumulation of yet another year of seismic data. These data were employed to make initial estimates of the background seismicity rates for the newly monitored volcanoes and to revise the rate estimates of the other volcanoes. The results of this exercise are summarized in Tables 1 and 2.

In some cases, the previous estimates were obviously inaccurate representations of the true background seismicity rates. For example, the computed background seismicity rate for the Akutan region was generally much greater than the observed rate. This mean background rate was computed using data for the six-month time period of August 1996-January 1997. Shown in Figure 15 is a histogram of the number of located earthquakes at Akutan as a function of time. From this plot it appears that the seismicity in the Akutan region did not decrease to its background level until about October 1996. Using data prior to this date for the mean rate calculation would, therefore, result in an over-estimation of the background seismicity rate at Akutan. Because of this fact and to be more consistent with the time periods over which the seismicity rates have been computed for the Cook Inlet volcanoes a more "conventional" time period (i.e. January-December) was used for rate calculations for Akutan and the other volcanoes that AVO began monitoring in 1996. Therefore, for Akutan, Dutton, Makushin and Pavlof Volcanoes only the 1997 data were used to determine the respective mean seismicity rates. In the case above, a total of 42 earthquakes were located in the Akutan region during 1997. The resultant mean seismicity rate is thus 3.5 located events per month. This value is considerably lower than the initially estimated background rate of 11.5 events per month.

For the two new seismic networks (i.e., Aniakchak and Shishaldin) the mean seismicity rates were determined over a much shorter time period than was the case with the other networks. Since the Aniakchak network was not running on the data acquisition system until mid-July 1997, the time period over which its mean seismicity rate was calculated was August-December 1997. Two events were located in this region during this

5-month period resulting in a mean seismicity rate of 0.4 events per month.

The Shishaldin network came online during early August 1997. The time period of the rate calculation was thus September-December 1997. During this four-month period, a total of 30 earthquakes were located in this region. The mean seismicity rate for the Shishaldin area is, therefore, 7.5 events per month.

For Augustine, Redoubt and Spurr Volcanoes, the additional year of data was simply added to that of the previous three-years of accumulated data. In the case of Augustine, regional events and local events believed to be related to the formation and/or movement of shore-ice or otherwise suspected of being weather related were not included in the mean rate calculation. For both Redoubt and Spurr, the mean seismicity rates were determined only for the regions within 10 km of the respective summits.

The determination of the previous seismicity rate at Iliamna was not a straight-forward process. During the Iliamna seismic swarm of 1996; additional stations were deployed to the area thus improving the detection threshold. Use of data from the swarm would greatly skew the data, so the only data available was obtained using the initial detection threshold. An attempt was made to computationally alter the pre-swarm data to reflect the background seismicity rate one would expect with the new and improved detection threshold. It is now possible to use the 1997 data to test how good this background rate estimate was. Using all of the earthquakes that were located close to Iliamna during 1997 (i.e. 308 events) the mean seismicity rate comes out to be 25.7 located events per month. If one looks at a histogram of the 1996-1997 Iliamna data (fig. 16), however, it appears that seismicity was still at elevated levels until at least during March 1997. If data from January and February 1997 are excluded from the rate calculation;

Table 1

Volcano	Number of Events	Seismicity Rate (Events/Month)	Time Period of Average
Akutan	42	3.5	1-year
Aniakchak	2	0.4	5-months ^A
Augustine	399	8.3	4-years
Dutton	3	0.3	1-year
Iliamna	142	14.2	10-months ^B
Katmai region*	680	85.0	8-months ^C
Makushin	89	7.4	1-year
Pavlof	9	0.8	1-year
Redoubt	349*	7.3	4-years
Shishaldin	30	7.5	4-months ^D
Spurr	401*	8.3	4-years

^A The time period covered is August-December 1997.

^B The time period covered is March-December 1997.

^C Much of the Katmai network was out from April 16-July 20, 1997. The time period covered is January-March 1997 and August-December 1997.

^D The time period covered is September-December 1997.

* Values given here are for the entire Katmai/Valley of Ten Thousand Smokes region as shown in the revised seismicity basemap for this area.

+ Earthquakes located within 10 km of the respective summits.

Table 2

Katmai Region Volcanoes	Number of Events	Seismicity Rate (Events/Month)
Griggs	3	0.4
Katmai	80	10.0
Mageik	142	17.8
Martin	264	33.0
Martin/Mageik	406	50.8
Novarupta	112	14.0
Trident	32	4.0

then one finds the mean seismicity rate at Iliamna to be 14.2 events per month. This value agrees relatively well with the previous estimate. It is possible that the above rate may be an over-estimation; from the histogram it appears that an additional decrease in the seismicity rate may have occurred starting in August. Additional data will be required to determine if this is just a small scale fluctuation in seismicity rate, or indeed, reflects the actual background seismicity rate.

Seismicity within the Katmai/Valley of Ten Thousand Smokes region has been problematic with respect to the assignment of activity to the various volcanoes in the region. This problem stems from the fact that AVO monitors a total of six closely spaced volcanoes in this region. Since the average spacing between the volcanoes is about 10 km one could assign those earthquakes having locations within 5 km of a volcano to that respective volcano. In those cases in which there is overlap of the 5 km zones (e.g. Martin and Mageik) earthquakes would be assigned to the closer of the two volcanoes. To determine distances from the epicenters to the various volcanoes the NEAREST program was applied to the 1997 data using a script written by Mitch Robinson. Since a large part of the Katmai network was out from April 16-July 20, 1997 only data from the time periods of January-March 1997 and August-December 1997 were employed in the mean seismicity rate calculations. The results of these calculations are summarized in Table 2.

It is somewhat uncertain as to whether the activity associated with Martin and Mageik is a single zone of activity or can be delineated into two closely spaced clusters of activity. As a result, values for Martin and Mageik are given both individually as well as their combined total.

The data and calculated values for the remaining volcanoes are pretty self explanatory. The mean seismicity rates for Dutton, Pavlof and Makushin

were calculated using the data for the entire year of 1997. The pertinent information for these volcanoes are summarized in Table 1.

Scott Stihler, John Benoit, John Power, Art Jolly, Steve McNutt, Cristyn Presley, Bob Hammond, Guy Tytgat, Chris Larsen, and Chris Stephens

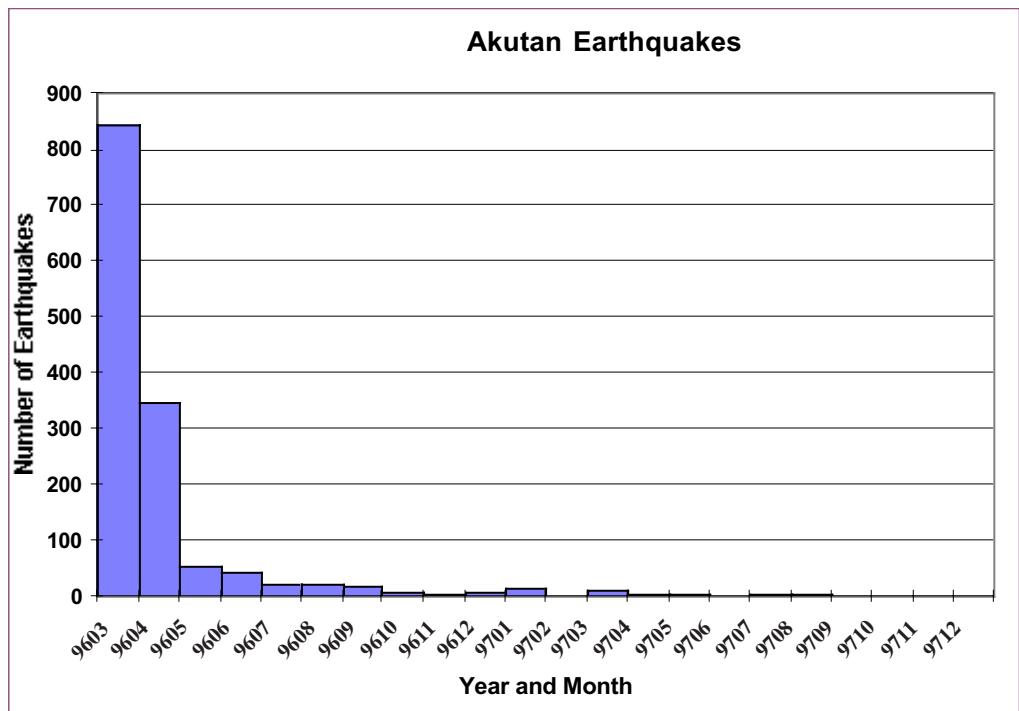


Figure 15: Histogram of the number of located earthquakes at Akutan as a function of time.

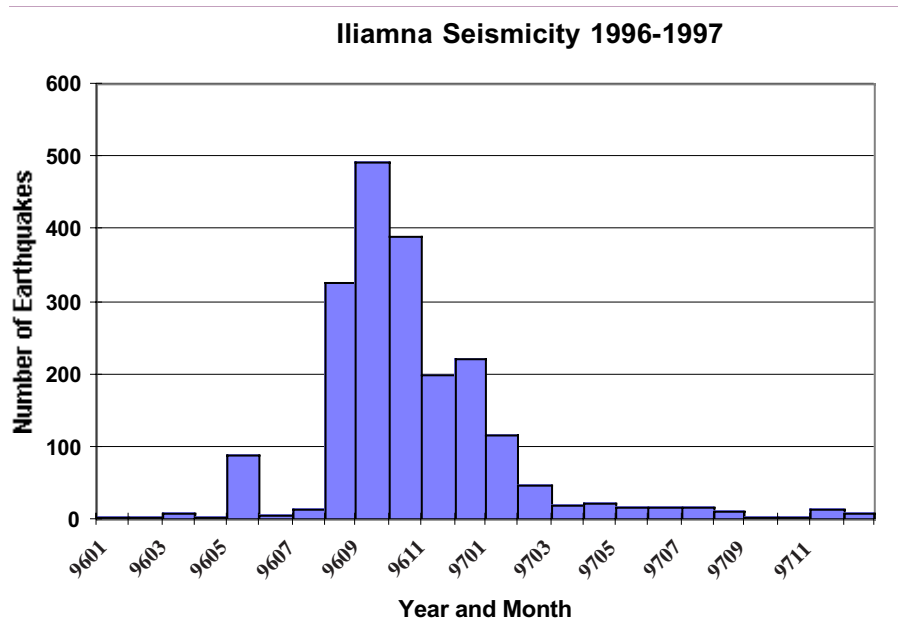


Figure 16: Histogram of the number of located earthquakes at Iliamna as a function of time.

Augustine Deformation

GPS

Bad news on the GPS front: both Windy and Domo GPS stations are still not collecting data. Mound GPS is working well, but with no other station working, it is useless. Hopefully, warm weather will cure our problems. Good news is that most of the tiltmeters are still functioning properly. It looks like OTTER may have died in mid-April (Fig. 21). There are no significant signals in any of the other tiltmeters.

Following the first week of January, both DOMO and WINDY (figs. 17 & 18) GPS receivers decided to no longer work. We have several guesses on what may have happened. They are:

- 1) The antennas are several years old and the seals may have weakened enough to allow water to be forced into the antennas,
- 2) The antenna cables, or more likely the antenna connectors are bad. or,
- 3) Both receivers died. Our guess is that there is a combination of all three to cause both units to quit working.

The good news is that MOUND continues to work great. We will fix the problem in this coming summer field season.

DOMO TILTMETER

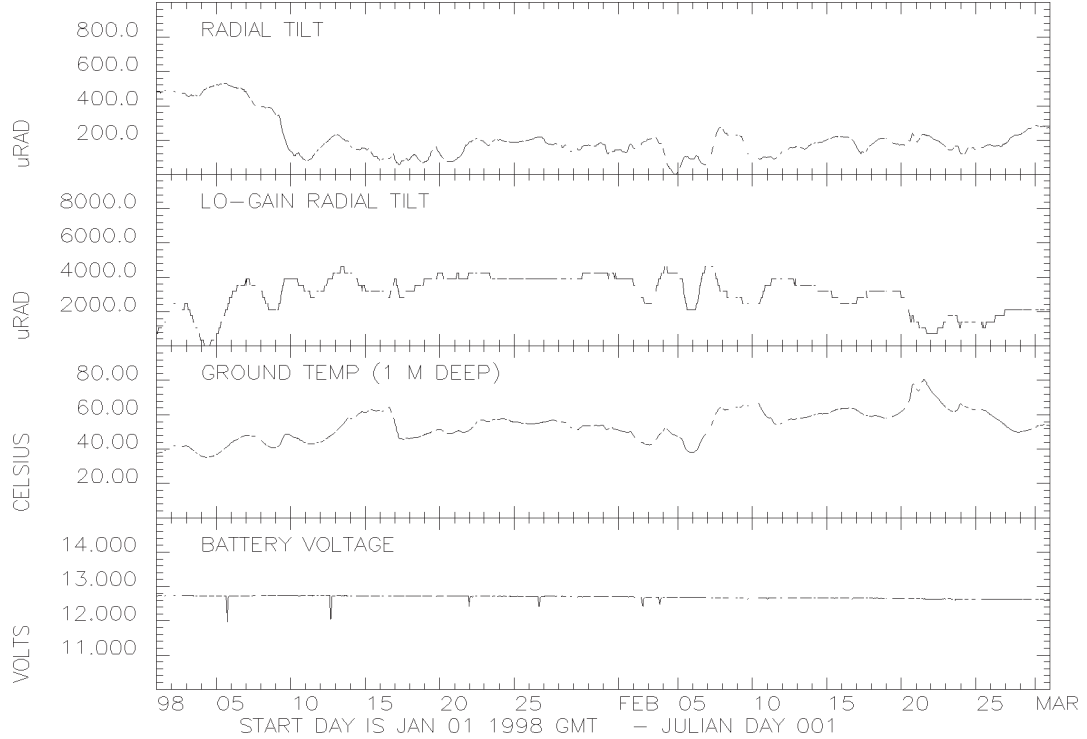
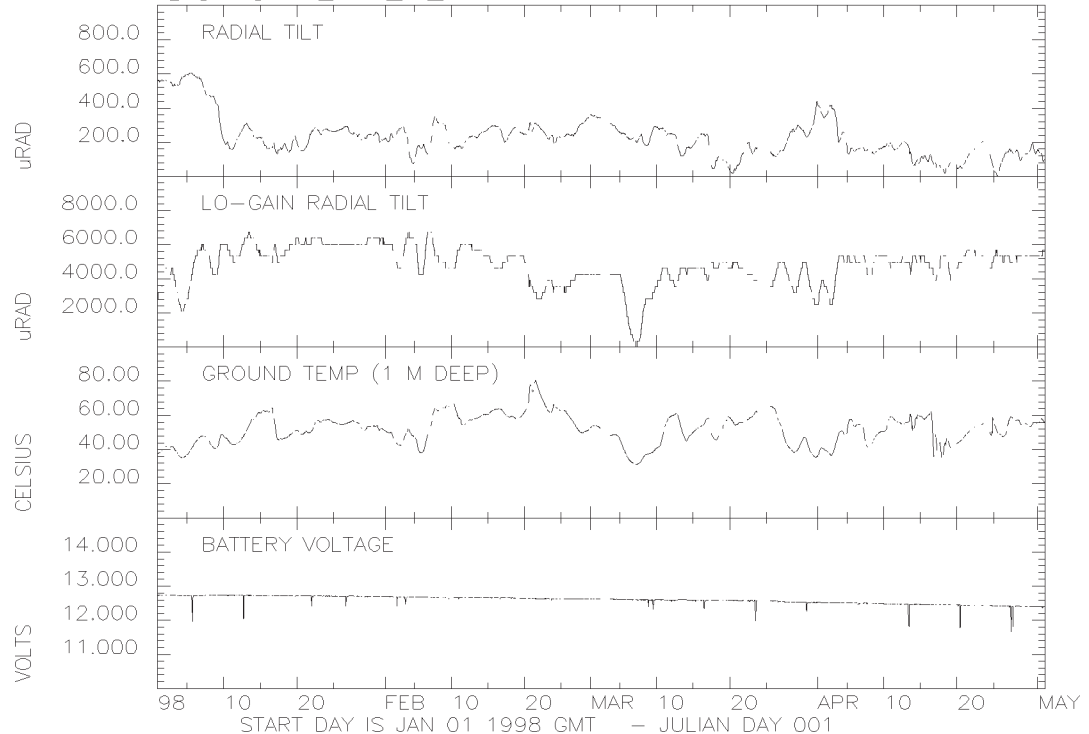


Figure 17. DOMO tiltmeter plots.

DOMO TILTMETER



TILTMETERS

Augustine tiltmeters are all working. The plots show no significant change on any of the tiltmeters. The only real glitch is on MOUND (fig. 19)

where the x-axis signal dropped for several hours and then came back up again. This can probably be attributed to cold electronics.

Gene Iwatsubo

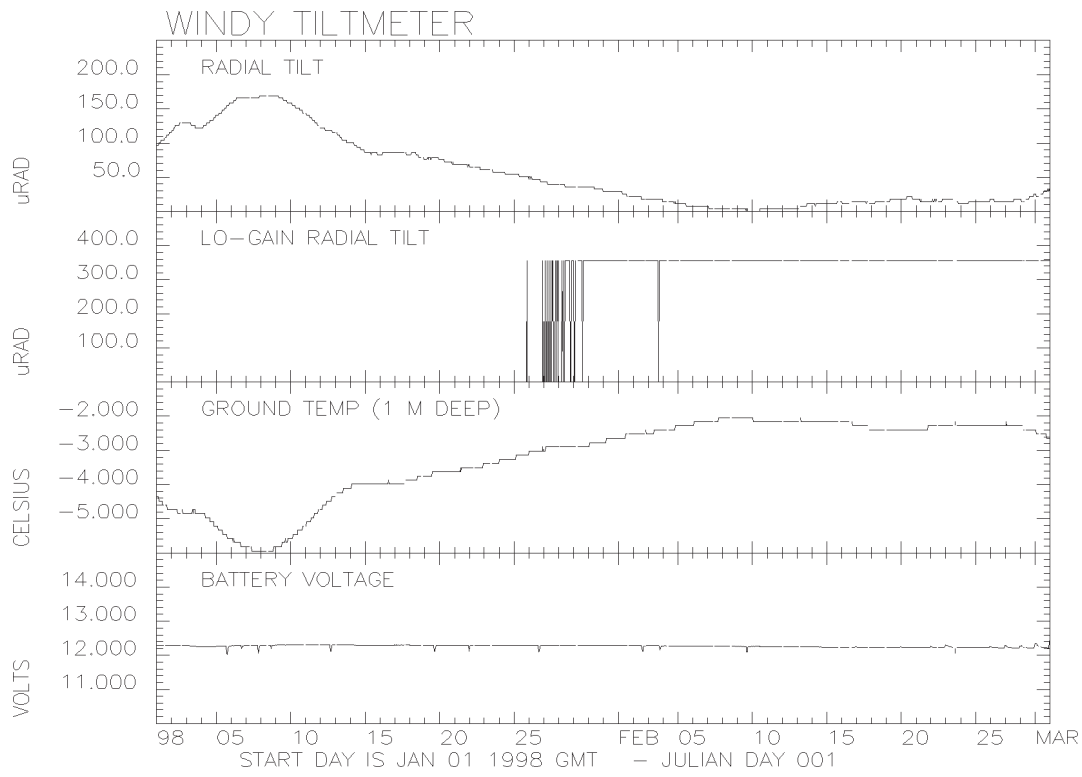
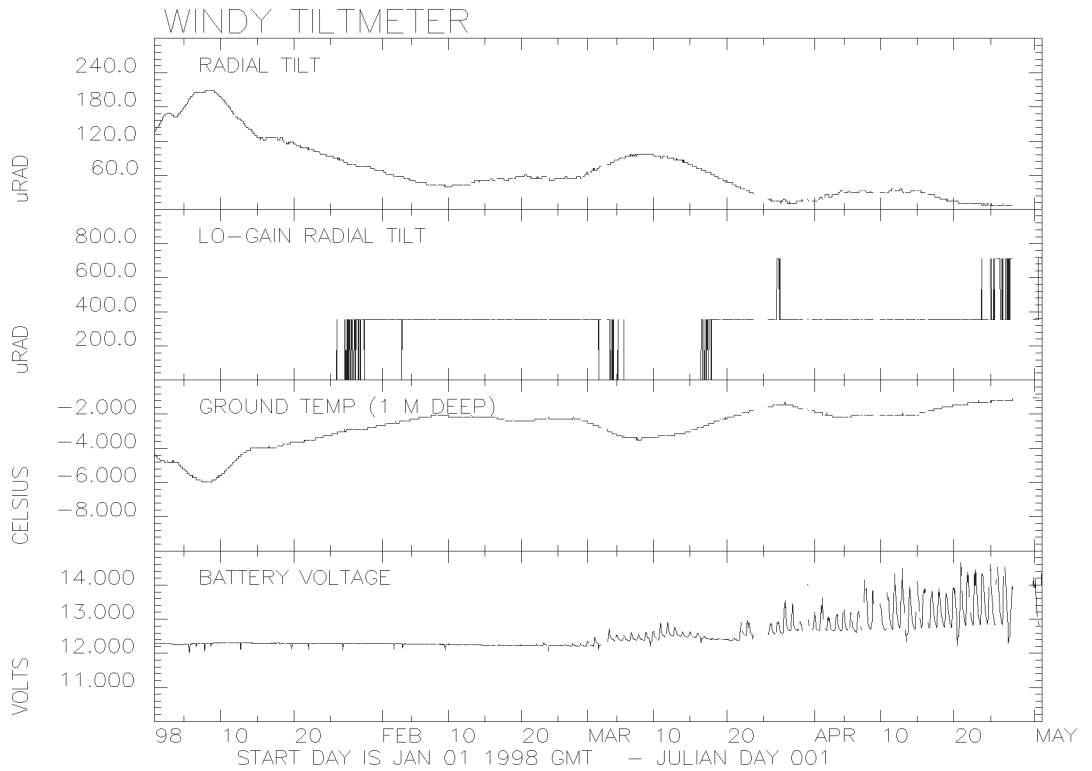


Figure 18. WINDY tiltmeter plots.



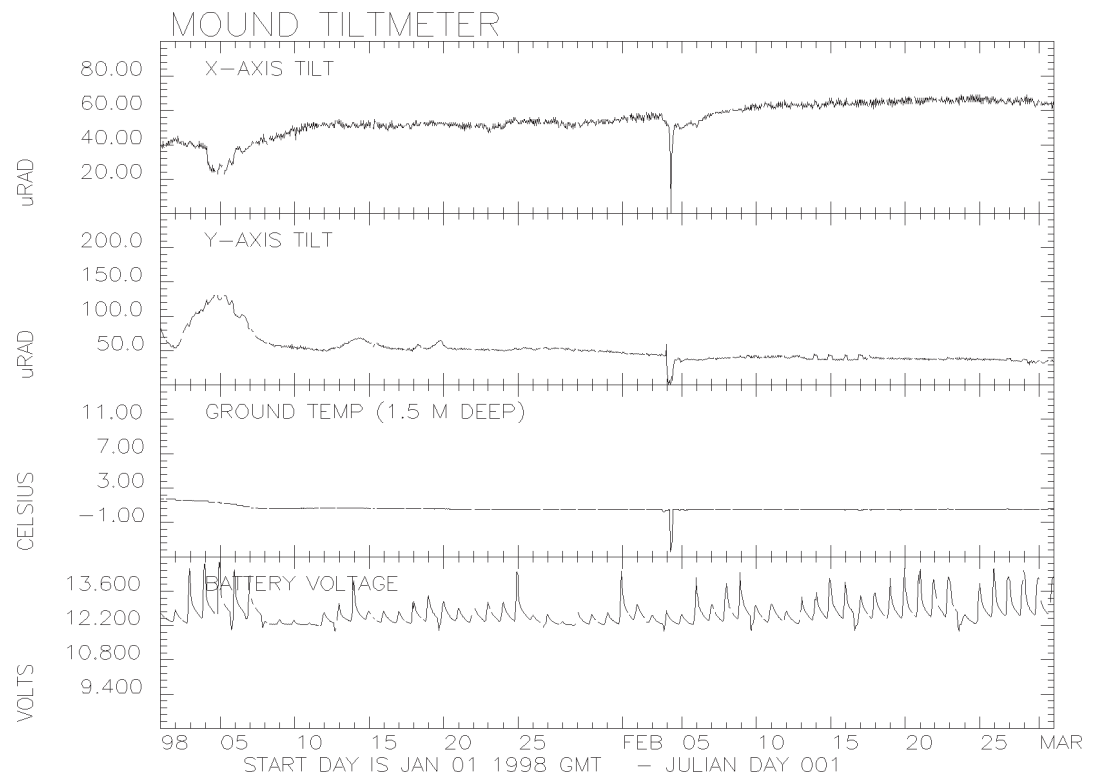
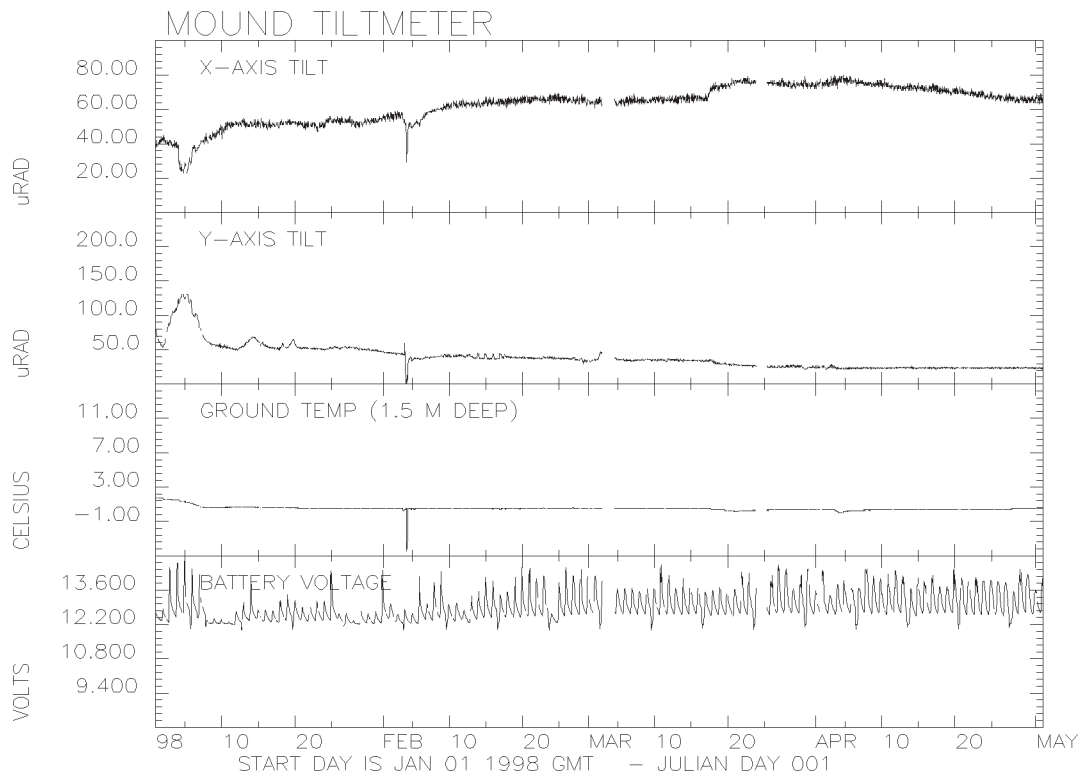


Figure 19. MOUND tiltmeter plots.



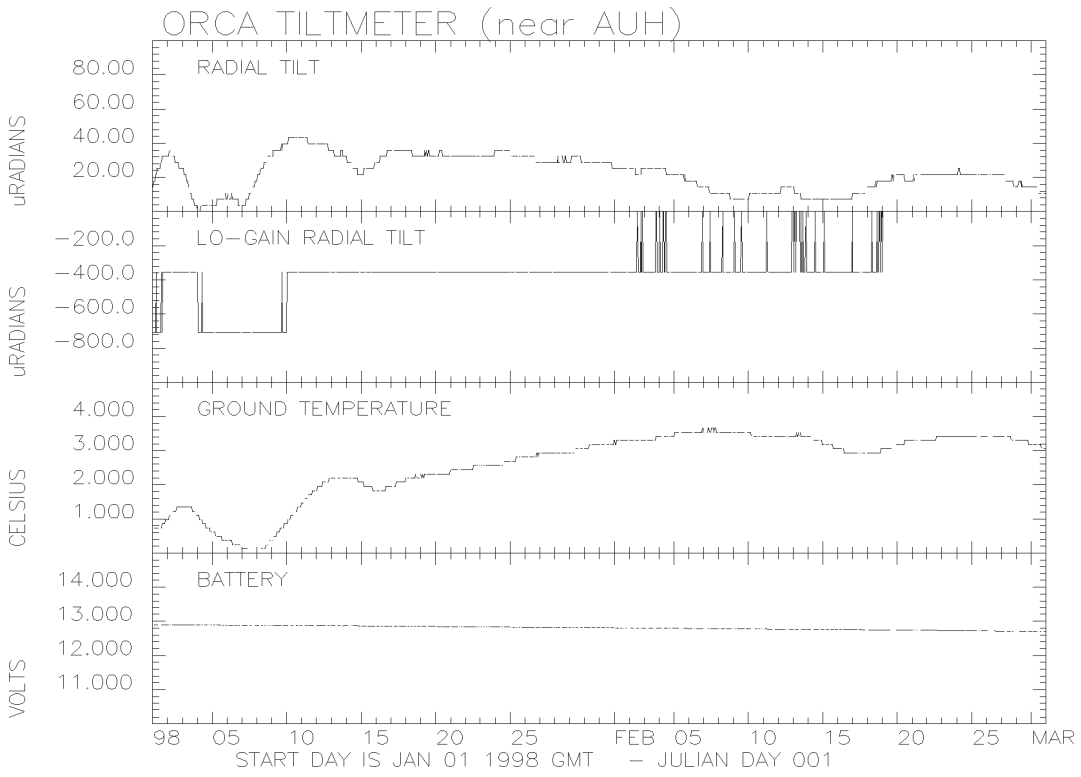
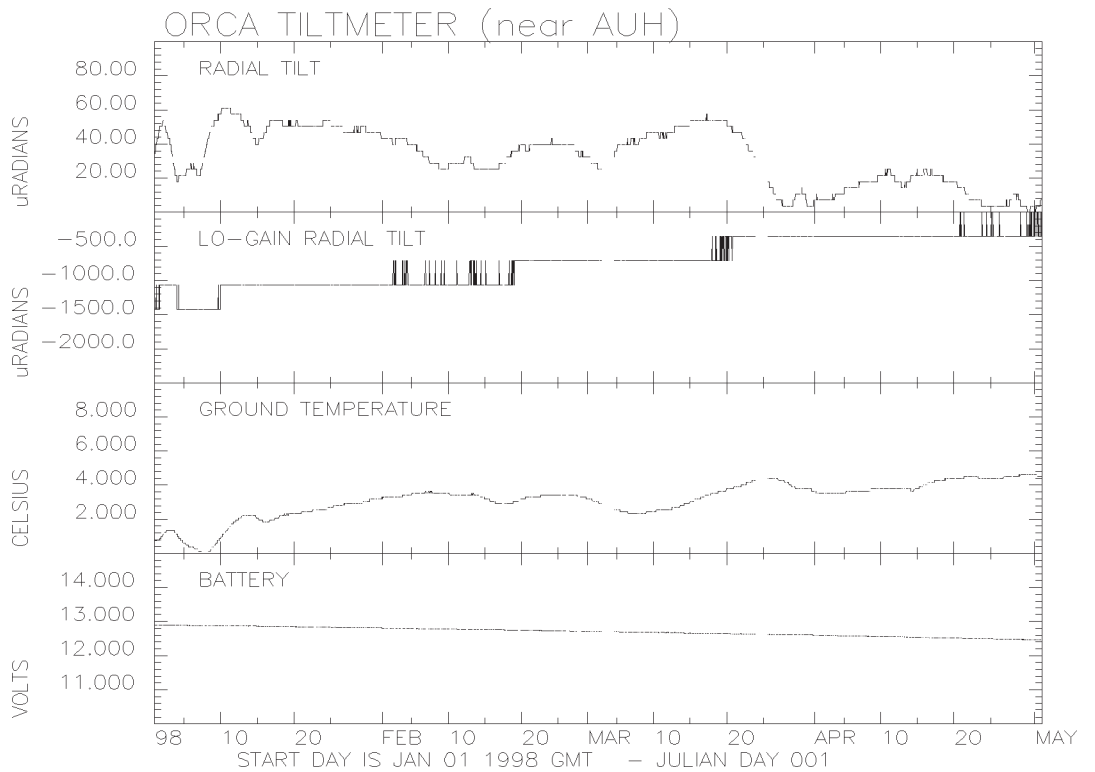


Figure 20. ORCA tiltmeter plots.



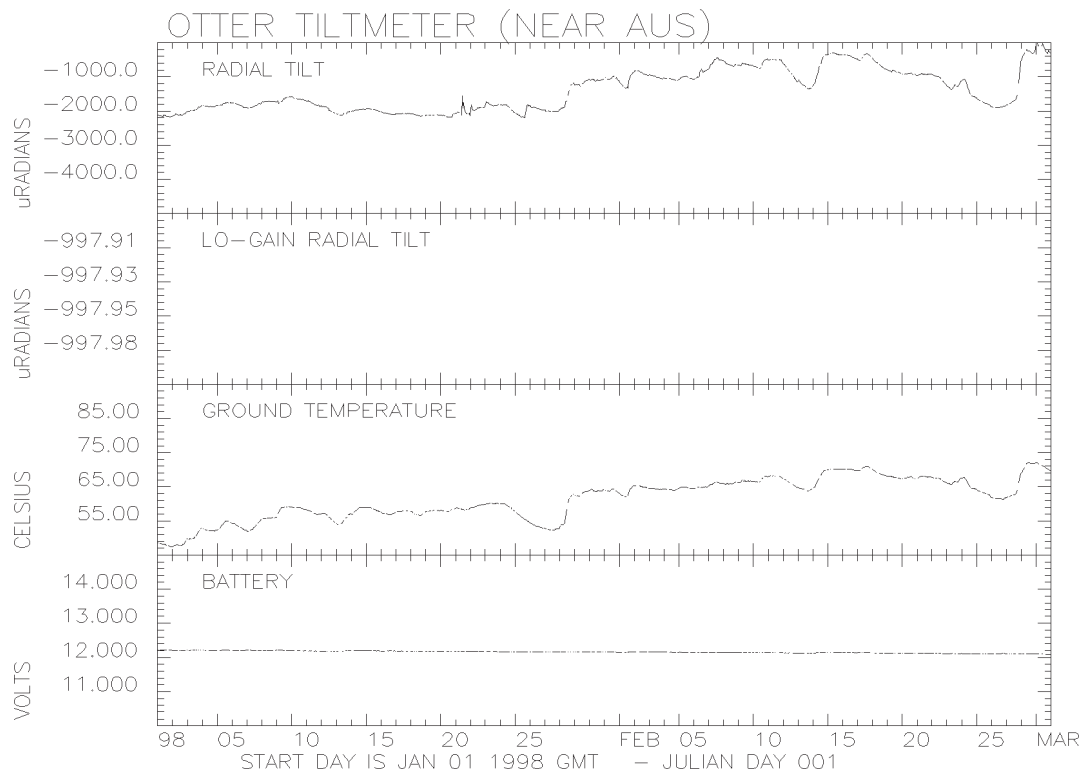
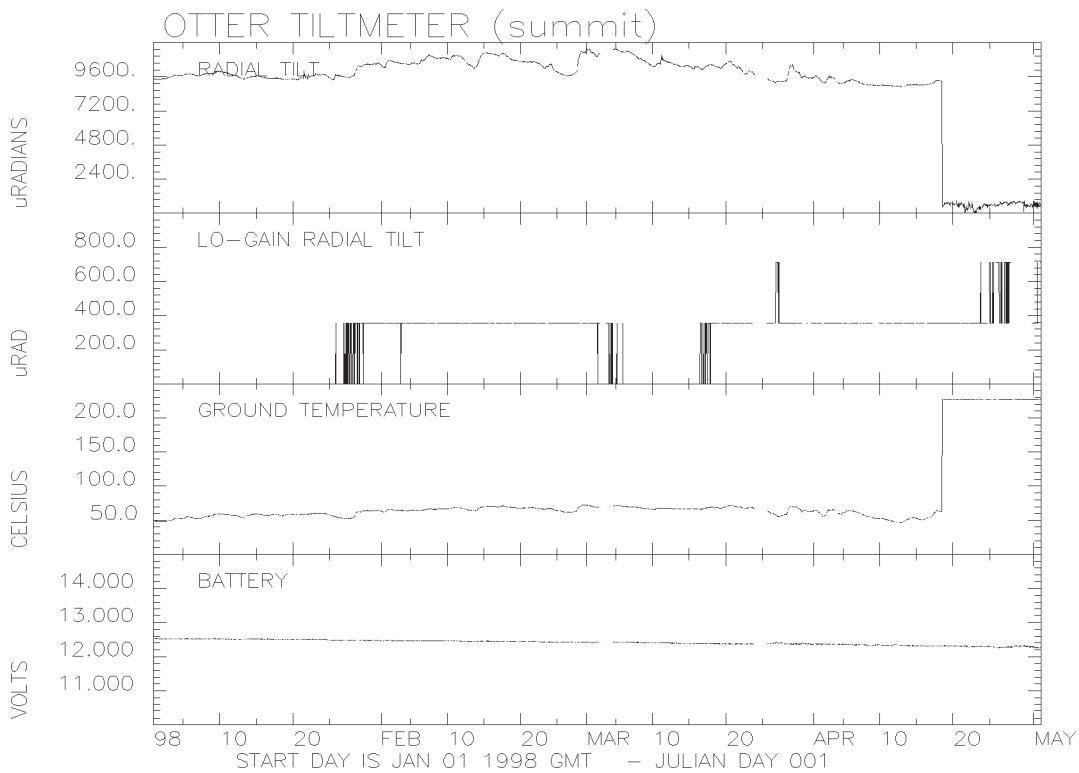


Figure 21. OTTER tiltmeter plots.



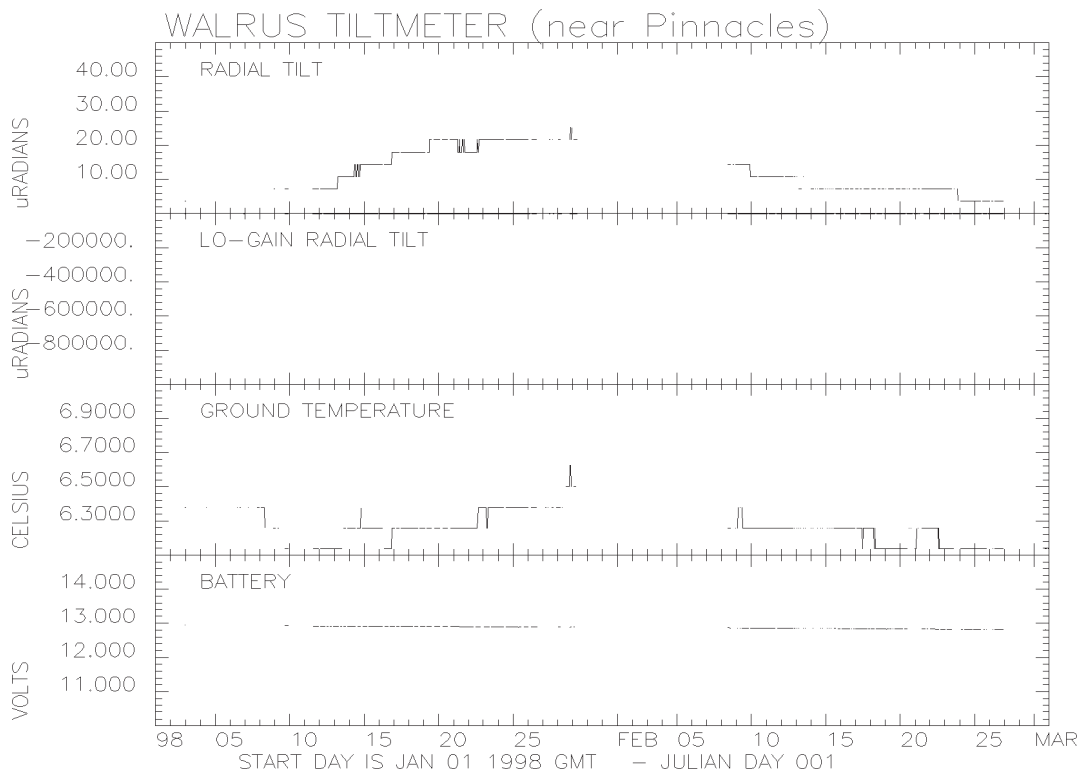
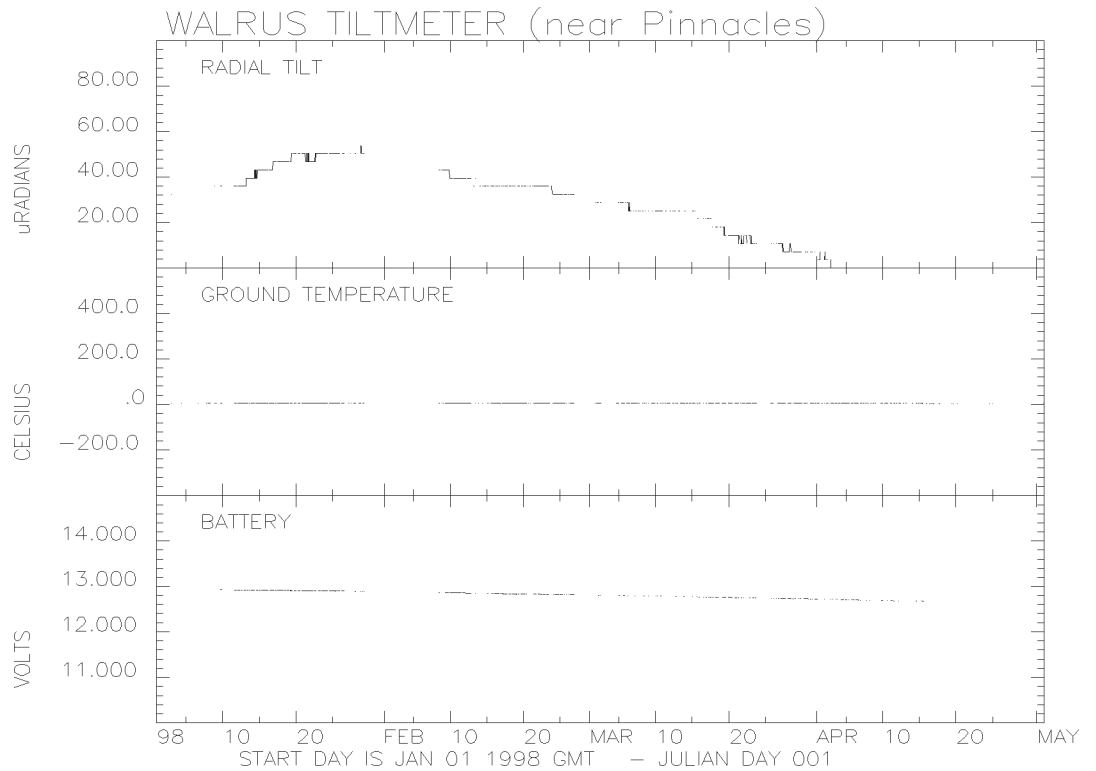


Figure 22. WALRUS tiltmeter plots.



Operations

AVO on the Web

The number of users accessing the AVO public web page (www.avo.alaska.edu) has continued to increase. For the third year access strongly peaked in February and March, coincident with science fair times at public schools throughout the country. In the past two years we took the peaks in spring access to be a result of increased public interest caused by individual eruptions or seismic crises. During the spring of 1998 there were no notable eruptions making national headlines. We are not sure if increased access by K-12 students can explain all of the peaking, but there is definitely a large increase in e-mail traffic to the AVO webmaster from students during this time.

The AVO public web page continues to be an excellent outreach vehicle. Design and construction of an updated public web page are in progress. The new public page will deliver much of the same content of the current page, but in a more organized, easier-to-follow format. In addition to the popular features of the current public page, the new page will offer many new types of information to interested users.

Most Internet users are beginning to expect much more than simple

textual information from web pages. Though the Internet is an invaluable source for basic information, the net is enjoying greater utility as a tool for data distribution. Along with having a number of AVO publications available as PDF documents, the new page may become a medium for many other types of information.

Much of the current geologic data collected by AVO is being organized, stored, and output using GIS spatial database tools. These data are currently available to the public as reports, plotted maps, and digital geographic coverages. New tools are constantly being developed that allow GIS data to be disseminated over the web. ArcSDE is a new spatial data access engine that provides map information data to multiple users over local area, wide area and Internet networks. This information can be used interactively - users can customize map displays and query attached databases of such things as field notes, photographs, and explanatory text. AVO is evaluating the use of SDE for some upcoming publications which would normally be static maps. AVO web users would not only acquire spatial geologic data from the public page, they could actively query and use the database from a remote location. Users with varying interests can access the database and retrieve whatever types of information suit a particular need.

Careful design and format of the new page will allow new tools and data to be accessible to the public over the web.

*Andrew McCarthy and
Chris Nye*

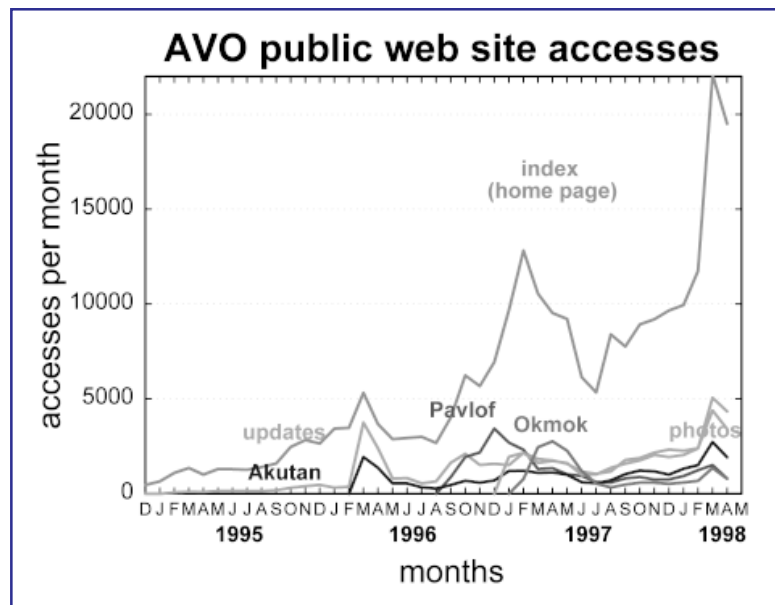


Figure 23: Graph of AVO on the Web.

New Initiatives

Aleutian Science and Technology Center: Eruptions, Earthquakes, and the Origin of Continents

A preproposal to the National Science Foundation submitted February 12, 1998

Proposal Summary

Three decades ago, development of plate tectonic concepts led to a quantum jump in our understanding of the workings of Earth. The distribution of features on the surface at last "made sense". We learned that the planet's skin is broken into semi-rigid plates, and that there are three basic modes of plate interaction: convergence, extension, and translation. Of the three, convergence remains most enigmatic despite its recognized role as generator of continent-like crust, the largest volcanic eruptions, the greatest earthquakes, the tallest mountains, the deepest abysses, and a good fraction of the resources that fuel human achievement. For these reasons, understanding of convergent margins is at the forefront of scientific need, and of the interaction between Earth science and society.

The Aleutian arc is convergence's quintessential laboratory. It is at once highly active, beautifully simple, and richly diverse. No other arc combines such a high level of volcanic and seismic activity with such an elegantly simple setting. Unique among arcs, systematic changes in key convergence variables—velocity, angle, crustal type—are arrayed along its 5000-km length. At times of cold and hot wars, the arc has hastily attracted strategic attention: it is the North American - Asian gateway by air, island and sea. But for the most part, the arc has been shrouded in mystery of lasting scientific neglect. The Aleutians are as remote as they are blessed by a challenging of climate. Nothing less than cutting-edge technology and the closest of international cooperation are needed to transform the arc's scientific mystery into analytic mastery of the convergent process. These islands are hell and heaven where continents are born;

they are perhaps the last rich geofrontier on Earth to be explored. Indeed, it could be said that the same satellite-borne radar technology that discovered the volcanoes of cloud-shrouded Venus first revealed the starkly primordial character of the Aleutian volcanic arc. Other-worldly as this volcanic chain seems, it stands poised to disrupt, perhaps lethally, one of the busiest international air transportation corridors, and to generate powerful tsunamis that would endanger coastal populations over the entire Pacific region. Monitoring efforts for hazards, such as those of the Alaska Volcano Observatory, have increased in recent years as enabling computing and satellite-based technologies have developed and as the risk, particularly to aircraft, has become more widely appreciated. Now monitoring needs a more scientific basis, and advanced technologies have the capability to provide it.

Plate tectonics gave us only a first-order physical description of relative movement. But the Earth system entails major fluxes of mass and energy that accompany these movements, and understanding these fluxes and processes remains at an early stage. To take on this challenge for the Aleutian arc, the Universities of Alaska Fairbanks (UAF), Columbia, Cornell, Brown, Washington, Hokkaido, Tokyo, and Tohoku, the Lawrence Livermore National Laboratory, the US Geological Survey, the Alaska Division of Geological and Geophysical Surveys, the Keck College Geology Consortium, and the Institute for Volcanic Geology and Geochemistry (Kamchatka) propose to form the Aleutian Science and Technology Center (ASTeC). ASTeC will address the following basic questions:

1. How does plate convergence lead to magma generation and crustal growth?
2. How do variations in the structure and movement of the two plates control the character of resulting volcanism, seismicity and crustal deformation?
3. Why does the plate boundary, the locus of these processes, take on an arcuate shape, with abrupt extremities marked by singularly high topography and intense deformation?
4. Where are magmas stored and how do they ascend, chemically differentiate and erupt?
5. What controls the size and frequency of earthquakes and tsunamis?
6. What is the impact of these processes on the biosphere?

7. How do we apply technological advances to monitor geodynamic processes in challenging environments?
8. How do we engage the learning population in developing an understanding of solid Earth processes and the importance of their societal impact?
9. How do we transfer our newly acquired knowledge of solid Earth processes to those who mitigate geohazards, manage natural resources, and develop environmental policies, including policies regarding climate change?

ASTeC's center approach will bring an array of disciplines to bear on these problems, make logistical and technological aspects of the research tractable, integrate foreign institutions into a comprehensive effort, provide a "big picture" dimension to current hazard-driven volcano and earthquake monitoring efforts, and make education and knowledge transfer an integral part of the conduct of science in the region. Carefully coordinated field campaigns on both land and sea, supplemented by remote-sensing data from space, will image plate boundary, magma system, and crustal structures and track active Earth process in real time. These observations, together with surface geochemical and geologic data, will be used to test and extend our understanding of the origins of eruptions, earthquakes, and continents.

Principal Investigator:

John C. Eichelberger,

Co-Principal Investigators:

*Klaus Jacob, Columbia University
Minoru Kasahara, Hokkaido University
Suzanne Kay, Cornell University
Thomas P. Miller, US Geological Survey*



Picture of Thomas Hammerich taken with the WebCam

Personnel

Please welcome the following employees to our AVO team:

Glenn Thompson - Fairbanks. Working with Steve McNutt on Web-based seismic monitoring of volcanoes. Came from University of Leeds, England, where he did research on modelling volcano-seismic sources. Also has a Masters in Exploration Geophysics (Durham, 1994) and a first degree in Theoretical Physics (St. Andrews, 1993).

Andrew McCarthy - Fairbanks, Bachelors in Earth Science; and Biological Science, 1997, University of Alaska Fairbanks. Geologist with ADGGS. Currently working on various AVO Web and GIS projects with Chris Nye.

Jean Sobolik

Practical at the Alaska Volcano Observatory

Thomas Hammerich performed a practical at the Alaska Volcano Observatory between the dates of 15th February and 14th July 1998. He worked on the AVO WebCam project, the purpose of which was to:

- 1) research and analyze existing WebCam systems
- 2) collaborate with Japanese scientists working on FujiCam
- 3) design a WebCam system for AVO
- 4) acquire equipment and software
- 5) assemble and test the components
- 6) develop Web pages for implementing the system
- 7) investigate possible camera sites.

In addition he reorganized several years of helicorder records from Dutton volcano in preparation for further analysis, and also assisted with AVO fieldwork such as GPS surveying of the Denali fault.

Steve McNutt

Outreach

The Alaska Science and Engineering Fair was held on March 28th and 29th on the University of Alaska, Anchorage Campus. The fair was a huge success with about 600 students from kindergarten through twelfth grade from all over Alaska competing. This year, AVO awarded Special Recognition ribbons to students with volcano related projects.

Three were awarded to:

"Volcanoes Erupt"
Branden Samorajski
Rogers Park Elementary School - fourth grade
(Terry Keith was his mentor)

"Erupting Volcano"
Garrett McLean and Kyle Miller
Northern Lights ABC - second grade

"El Nino/Southern Oscillation, (ENSO), Submarine Tectonic, and Volcanic Activity, Sunspots, Earthquakes and a Theoretical Model"
Dorothy Adams
Colony High School - twelfth grade

The Fairbanks North Star District Science Fair was held on April 9 and 10 at Alaska Land. Over 400 students from kindergarten through eighth grade contributed projects. The AVO ribbons were awarded to 11 pupils:

"Mt. Zachary Erupts"
Jane Kurtz - second grade
"Volcanoes"
Joshua Weber - second grade
"Inside the Earth"
Alan Wiswell - second grade
"Volcanoes"
Ashley Roberts - fourth grade
"What Does the Middle of a Volcano Look Like"
Eria Droese - fourth grade
"Volcanic Rock"
Logan Burgess - fourth grade
"Mountains of Lava"
Amber Nickerson - fifth grade
"The Geysers of Yellowstone Park"
Alesia Aalmela - fifth grade
"Collection, Identification, and Classification of Rocks and Minerals"
Sagar Kamath - fifth grade
"Specific Gravity"
Jane Powers - sixth grade
"America the Colors"
Emily Jo Yates - sixth grade

The science fair ended with an awards ceremony where groups from throughout the community awarded,

ribbons, certificates, calendars and even cash prizes. Next year, I hope our outreach program can contribute even more to encourage these young scientists.

Steve Estes

Publications

Begét, J.E., and R.J. Motyka, 1998, *New dates on late Pleistocene dacitic tephra from the Mount Edgecumbe Volcanic Field, Southeastern Alaska, Quaternary Res., 49, 123-125, Article No. QR997194.*

Child, J.K., J.E. Begét, and A. Werner, 1998, *Three holocene tephra identified in lacustrine sediment cores from the Wonder Lake Area, Denali National Park and Preserve, Alaska, USA, Arctic and Alpine Res., Vol. 30, No. 1, p. 89-95.*

Power, J.A., and E.Y. Iwatsubo, 1998, *Measurements of Slope Distances and Zenith Angles at Augustine Volcano, Alaska 1986, 1988, and 1989, USGS Open-File Report 98-145, 17 pages.*

Addendum

Log of Updates for the Current Period

ALASKA VOLCANOES UPDATE

Friday, January 2, 1998 11:00 AM
AST (2000 UTC)

Volcano	Lat. - Long.	Elevation
Chiginagak	57.13N 157.00W	7005 ft (2135 m)

Poor weather conditions obscured visual observations of the volcano during this past week. No thermal anomalies were visible on satellite imagery during clear periods. Chiginagak Volcano is not monitored by seismic instrumentation. However, AVO is in contact with USFWS staff who frequently overfly the area and with citizens of Pilot Point who have a view of the volcano during clear weather.

Beginning on October 22, AVO received multiple reports of increased steaming, snowmelt, and sulfur smell at Chiginagak Volcano, a 7005-ft-tall (2135 m) snow- and ice-covered symmetric stratovolcano. It is located 110 miles (175 km) south of King Salmon and 37 miles (60 km) southeast of Pilot Point on the Alaska Peninsula. Robust steam plumes have issued from an active fumarole at an elevation of about 5500 feet (1676 m) on the north flank of the volcano since at least 1943 and sulfur deposition in the vicinity of the fumarole discolors the adjacent snow and ice. Reports of historic activity at Chiginagak are poorly documented. Prehistoric domes, young pyroclastic deposits and lava flows occur on the volcano's flanks.

Other Volcanoes:

Seismic activity is monitored in real time at 16 volcanoes in Alaska. Some of these volcanoes may currently display anomalous seismicity, but they are not considered to be at a dangerous level of unrest.

Spurr, Redoubt, Iliamna, Augustine, Griggs, Katmai, Novarupta, Trident, Mageik, Martin, Pavlof, Dutton, Akutan, Shishaldin, Aniakchak and Makushin volcanoes are all at or near normal levels of background seismicity.

ABBREVIATED COLOR CODE KEY
(contact AVO for complete description)

GREEN	volcano is dormant; normal seismicity and fumarolic activity occurring
YELLOW	volcano is restless; eruption may occur
ORANGE	volcano is in eruption or eruption may occur at any time
RED	significant eruption is occurring or explosive eruption expected at any time

Volcano Information on the Internet:
[Http://www.avo.alaska.edu](http://www.avo.alaska.edu)
Recording of the Status of Alaska's
Volcanoes (907) 786-7478

INFORMATION RELEASE 98-1
KAMCHATKAN VOLCANIC ACTIVITY
Monday, January 5, 1998, 14:30 KST
(0230 UTC)

The following Release was received by e-mail from KVERT (Kamchatkan Volcanic Eruptions Response Team). All times are Kamchatkan Standard Time (21 hours ahead of AST)

Klyuchevskaya Group of Volcanoes
Klyuchevskoy Volcano:
56°03' N, 160°39' E; Elevation 4,750 m

**CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW**
During the last week (December 30, 1997-January 5, 1998), seismicity under the volcano continued to be above background levels and volcanic tremor is being registered under the volcano. On December 30, a gas and steam plume rose to a height of 1500 m above the summit crater, extending 3-5 km to the southeast. On December 31 and January 2 and 4, the fumarolic plume rose 200-500 m above the volcano. On other days, the volcano was obscured by clouds.

Sheveluch Volcano: 56°38'N, 161°19' E; Elevation 2,800 m

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**
No activity was observed. Seismicity is at background levels.

Bezymianny Volcano:
55°58'N, 160°36'E

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**
On December 30-31, a fumarolic plume rose 50-100 m above the volcano moving 3-5 km to the east and southeast. On other days, the volcano was obscured by clouds.

Karymsky Volcano:
54°03'N, 159°27'E

**CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW**
Seismicity remains above background level. The low level strombolian eruptive activity that has characterized the volcano for more than a year continues. Gas and ash explosions occurred every 30 minutes. Ash and steam rose to a height of 300-400 m above the crater.

Avachinskaya Group of Volcanoes:
153°15'N, 158°51'E

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**
Seismicity at Avachinsky volcano is at normal levels. Seismicity at Koryaksky volcano is above background level.

ALASKA VOLCANOES UPDATE

Friday, January 9, 1998; 11:30 AM
AST (2030 UTC)

Volcano Lat. - Long. Elevation
Chiginagak 57.13N 157.00W
7005 ft (2135 m)

During the past week, citizens of Pilot Point reported seeing the steam plume that has characterized Chiginagak Volcano's activity over the past several months. No thermal anomalies have been visible on satellite imagery. Due to the fact that there has been no significant change in activity, AVO will be removing Chiginagak Volcano from the update. How-

ever, AVO will continue its contact with USFWS staff who frequently overfly the area and with citizens of Pilot Point who have a view of the volcano during clear weather.

**INFORMATION RELEASE 98-2
KAMCHATKAN VOLCANIC ACTIVITY**
Monday, January 12, 1998, 8:30 KST
(2030 UTC)

*Klyuchevskaya Group of Volcanoes
Klyuchevskoy Volcano:* 56°03' N,
160°39' E; Elevation 4,750 m
**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

During the last week (January 6-11), seismicity under the volcano continued to be above background levels. On January 11, a gas and steam plume rose to a height of 50 m above the summit crater. On other days, the volcano was obscured by clouds.

Sheveluch Volcano: 56°38'N, 161°19' E; Elevation 2,800m

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**
No activity was observed. Seismicity is at background levels.

Bezymianny Volcano:
55°58'N, 160°36'E

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**
On January 11, a fumarolic plume rose 50 m above the volcano. On other days, the volcano was obscured by clouds.

Karymsky Volcano: 54°03'N, 159°27'E
**CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW**

Seismicity remains above background level. The low level strombolian eruptive activity that has characterized the volcano for more than a year continues. Gas and ash explosions occurred every 30 minutes. Ash and steam rose to a height of 300-400 m above the crater.

Avachinskaya Group of Volcanoes:
153°15'N, 158°51'E

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**
Seismicity at Avachinsky and Koryaksky volcanoes is at normal levels.

ALASKA VOLCANOES UPDATE

Friday, January 23, 1998; 11:00 PM
AST (2000 UTC)

Alaska Volcanoes:

Seismic activity is monitored in real time at 16 volcanoes in Alaska. Some of these volcanoes may currently display anomalous seismicity, but they are not considered to be at a dangerous level of unrest.

**INFORMATION RELEASE 98-4
KAMCHATKAN VOLCANIC ACTIVITY**
Monday, January 26, 1998, 8:30 KST
(2030 UTC)

*Klyuchevskaya Group of Volcanoes
Klyuchevskoy Volcano:*
56°03' N, 160°39' E; Elevation 4,750 m
**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

During the last week (January 20-26), seismicity under the volcano continued to be above background levels. On January 19 a fumarole plume rose 50 m above the volcano. On January 21-24 a gas and steam plume rose 100-300 m above the volcano, moving 2-3 km SE and NE.

Sheveluch Volcano: 56°38' N, 161°19' E; Elevation 2,800 m

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

On January 19 and 21, a gas and steam plume rose 50m above the volcano. On the afternoon of January 25, a gas and steam plume rose 800 m above the volcano. Seismicity is slightly above background levels.

Bezymianny Volcano: 55°58'N, 160°36'E

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

On January 19 and 22, a fumarolic plume rose 50-100m above the volcano, moving 5 km SE. On other days, the volcano was obscured by clouds.

Karymsky Volcano: 54°03'N, 159°27'E
**CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW**

Seismicity remains above background level. The low level strombolian eruptive activity that has characterized the volcano for more than a year continues. Gas and ash explosions occurred every 30 minutes. Ash and steam rose to a height of 300-400 m above the crater.

Avachinskaya Group of Volcanoes:
153°15'N, 158°51'E

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**
Seismicity at Avachinsky and Koryaksky volcanoes is at normal levels.

ALASKA VOLCANOES UPDATE

Friday, January 30, 1998; 9:30 AM
AST (1830 UTC)

Alaska Volcanoes:

Seismic activity is monitored in real time at 16 volcanoes in Alaska. Some of these volcanoes may currently display anomalous seismicity, but they are not considered to be at a dangerous level of unrest.

INFORMATION RELEASE 98-5
KAMCHATKAN VOLCANIC ACTIVITY
Monday, February 2, 1998, 11:30 PM
KST (2330 UTC)

Klyuchevskaya Group of Volcanoes:
Klyuchevskoy Volcano: 56°03' N,
160°39' E; Elevation 4,750 m
CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW

During the last week (January 27-February 1), seismicity under the volcano continued to be above background levels. On January 28 at 06:16 KST, seismic activation began under the volcano. During the remainder of the week, a series of earthquakes were registered at a depth of 25-30 km under the volcano, accompanied by volcanic tremor. On January 27, the fumarole plume rose 1000 m above the volcano moving to the east. On January 30, a gas and steam plume rose 100 m above the volcano, moving 1 km to the west.

Sheveluch Volcano: 56°38' N, 161°19' E;
Elevation 2,800 m
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN

During the past week, no volcanic activity was registered above the volcano. Seismicity is about at background levels.

Bezymianny Volcano:
55°58' N, 160°36' E
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN

On January 27, a fumarolic plume rose 800 m above the volcano. On January 30, a steam plume rose 50 m above the volcano. On other days, the volcano was obscured by clouds.

Karymsky Volcano: 54°03' N, 159°27' E
CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW

Seismicity remains above background level. The low level strombolian eruptive activity that has characterized the volcano for more than a year continues. Gas and ash explosions occurred every 30 minutes. Ash and steam rose to a height of 300-400 m above the crater.

Avachinskaya Group Of Volcanoes:
153°15' N, 158°51' E
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN

Seismicity at Avachinsky and Koryaksky volcanoes is at normal levels.

ALASKA VOLCANOES UPDATE
Friday, February 6, 1998; 9:30 AM
AST (1830 UTC)

Alaska Volcanoes:
Seismic activity is monitored in real time at 16 volcanoes in Alaska. Some of these volcanoes may currently display anomalous

seismicity, but they are not considered to be at a dangerous level of unrest.

INFORMATION RELEASE 98-6
KAMCHATKAN VOLCANIC ACTIVITY
Monday, February 9, 1998, 10:30 PM
KST (2230 UTC)

Klyuchevskaya Group of Volcanoes:
Klyuchevskoy Volcano: 56°03' N,
160°39' E; Elevation 4,750 m
CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW

During the last week (February 2-8), seismicity under the volcano continued to be above background levels. During the entire week, a series of seismic surface earthquakes was recorded accompanied by volcanic tremor. On February 3, the fumarolic plume rose 1500 m above the volcano, moving to the northwest. On February 4-5, a gas and steam plume rose 100-600 m above the volcano, moving 5-10 km southwest and south.

Sheveluch Volcano: 56°38' N, 161°19' E;
Elevation 2,800 m
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN

On February 3, 4, and 8, a gas and steam plume rose 200-1000 m above the volcano. Seismicity is a little above background levels.

Bezymianny Volcano: 55°58' N,
160°36' E
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN

On February 3-5, a fumarolic plume rose 50-300 m above the volcano. On other days, no activity was observed.

Karymsky Volcano: 54°03' N, 159°27' E
CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW

Seismicity remains above background level. The low level strombolian eruptive activity that has characterized the volcano for more than two years continues. Gas and ash explosions occurred every 30-40 minutes. Ash and steam rose to a height of 300-400 m above the crater.

Avachinskaya Group of Volcanoes:
153°15' N, 158°51' E
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN

Seismicity at Avachinsky and Koryaksky volcanoes is at normal levels.

ALASKA VOLCANOES UPDATE
Friday, February 13, 1998 11:00 AM
AST (2000 UTC)

Alaska Volcanoes:
Seismic activity is monitored in real time at 16 volcanoes in Alaska. Some of these volcanoes may currently display anomalous

seismicity, but they are not considered to be at a dangerous level of unrest.

INFORMATION RELEASE 98-6
KAMCHATKAN VOLCANIC ACTIVITY
Tuesday, February 17, 1998, 10:30 PM
KST (2230 UTC)

Klyuchevskaya Group of Volcanoes:
Klyuchevskoy Volcano: 56°03' N,
160°39' E; Elevation 4,750 m
CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW

During the last week (February 9-15), seismicity under the volcano continued to be above background levels. During all week the series of seismic surface earthquakes was recorded, accompanied by volcanic tremor. On February 9, the fumarolic plume rose 300 m above the volcano, moving to the west. On February 11-15, a gas and steam plume rose 100-2000 m above the volcano, moving 3-5 km south-east.

Sheveluch Volcano: 56°38' N, 161°19' E;
Elevation 2,800 m
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN

On February 11-12 and 14-15, a gas and steam plume rose 100-300 m above the volcano. Seismicity is a little above background levels.

Bezymianny Volcano: 55°58' N,
160°36' E
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN

On February 9 and 12-14, a fumarolic plume rose 50-200 m above the volcano. On other days, no activity was observed.

Karymsky Volcano: 54°03' N, 159°27' E
CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW

Seismicity remains above background level. The low level strombolian eruptive activity that has characterized the volcano for more than two years continues. From 70 to 100 gas and ash explosions occurred every day. Ash and steam rose to a height of 300-400 m above the crater. On February 9, eleven tectonic earthquakes were recorded at about 10 km south from the volcano.

Avachinskaya Group of Volcanoes:
153°15' N, 158°51' E
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN

Seismicity at Avachinsky and Koryaksky volcanoes is at normal levels.

ALASKA VOLCANOES UPDATE

Friday, February 20, 1998; 9:00 AM
AST (1800 UTC)

Alaska Volcanoes:

Seismic activity is monitored in real time at 16 volcanoes in Alaska. Some of these volcanoes may currently display anomalous seismicity, but they are not considered to be at a dangerous level of unrest.

INFORMATION RELEASE 98-8

KAMCHATKAN VOLCANIC ACTIVITY
Monday, February 23, 1998, 8:30 PM
KST (2030 UTC)

Klyuchevskaya Group of Volcanoes:

Klyuchevskoy Volcano: 56°03' N,
160°39' E; Elevation 4,750 m

**CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW**

During the last week (February 16-22), seismicity under the volcano continued to be above background levels. During all week the series of seismic surface earthquakes was recorded, accompanied by volcanic tremor. On February 17, the fumarolic plume rose 1000-3000 m above the volcano, moving 15 km to the southwest. On February 18-22, a gas and steam plume rose 100-1000 m above the volcano, moving 2-3 km southwest.

Sheveluch Volcano: 56°38' N, 161°19'E;
Elevation 2,800 m

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

On February 17-18 and 20, a gas and steam plume rose 50-200 m above the volcano moving 700 m southeast. Seismicity is about at background level.

Bezymianny Volcano: 55°58'N,
160°36'E

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

On February 17-18 and 20-22, a fumarolic plume rose 50-200 m above the volcano moving southeast.

Karymsky Volcano: 54°03'N, 159°27'E
**CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW**

Seismicity remains above background level. The low level strombolian eruptive activity that has characterized the volcano for more than two years continues. From 70 to 100 gas and ash explosions occurred every day. Ash and steam rose to a height of 300-400 m above the crater.

Avachinskaya Group of Volcanoes:
153°15'N, 158°51'E

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

Seismicity at Avachinsky and Koryaksky volcanoes is at normal levels.

INFORMATION RELEASE 98-9

KAMCHATKAN VOLCANIC ACTIVITY
Monday, March 2, 1998, 8:30 PM KST
(2030 UTC)

Klyuchevskaya Group of Volcanoes:

Klyuchevskoy Volcano: 56°03' N,
160°39' E; Elevation 4,750 m

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

During the last week (February 23-March 1), seismicity under the volcano continued to be above background levels. During the week, a series of deep earthquakes were recorded. On February 24-28 and March 1, a fumarolic plume rose 50-300 m above the volcano, moving 1.5-3 km to the southeast and northeast.

Sheveluch Volcano: 56°38' N, 161°19'E;
Elevation 2,800 m

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

On February 24, 28 and March 1, a gas and steam plume rose 100-500 m above the volcano moving 4 km to the east. Seismicity is about at background level.

Bezymianny Volcano: 55°58'N,
160°36'E

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

On February 23-25 and 28, a fumarolic plume rose 50-150 m above the volcano moving 2-5 km to the southeast. No seismicity was registered under the volcano.

Karymsky Volcano: 54°03'N, 159°27'E
**CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW**

Seismicity remains above background level. The low level strombolian eruptive activity that has characterized the volcano for more than two years continues. From 70 to 100 gas and ash explosions occurred every day. Ash and steam rose to a height of 300-400 m above the crater.

Avachinskaya Group of Volcanoes:
153°15'N, 158°51'E

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

Seismicity at Avachinsky and Koryaksky volcanoes is at normal levels.

ALASKA VOLCANOES UPDATE

Friday, March 6, 1998; 9:00 AM AST
(1800 UTC)

Alaska Volcanoes:

Seismic activity is monitored in real time at 16 volcanoes in Alaska. Some of these volcanoes may currently display anomalous seismicity, but they are not considered to be at a dangerous level of unrest.

INFORMATION RELEASE 98-10

KAMCHATKAN VOLCANIC ACTIVITY
Tuesday, March 10, 1998, 1:30 PM
KST (1330 UTC)

Klyuchevskaya Group of Volcanoes:

Klyuchevskoy Volcano: 56°03' N,
160°39' E; Elevation 4,750 m

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

During the last week (March 2-9), seismicity under the volcano continued to be above background levels. During the week, a series of deep (25-30 km) earthquakes were recorded. On March 5 and 7, a fumarolic plume rose 50 m above the volcano.

Sheveluch Volcano: 56°38' N, 161°19'E;
Elevation 2,800 m

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

On March 7, a gas and steam plume rose 100 m above the volcano. Seismicity is about at background level.

Bezymianny Volcano: 55° 58'N,
160°36'E

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

On March 5-7, a fumarolic plume rose 50 m above the volcano. No seismicity was registered under the volcano.

Karymsky Volcano: 54°03'N, 159°27'E
**CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW**

Seismicity remains above background level. The low level strombolian eruptive activity that has characterized the volcano for more than two years continues. From 70 to 100 gas and ash explosions occurred every day. Ash and steam rose to a height of 300-400 m above the crater.

Avachinskaya Group of Volcanoes:
153°15'N, 158°51'E

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

Seismicity at Avachinsky and Koryaksky volcanoes is at normal levels.

ALASKA VOLCANOES UPDATE

Friday, March 13, 1998; 10:30 AM AST
(1930 UTC)

Volcano Lat. - Long. Elevation
Chiginagak 57.13N 157.00W
7005 ft (2135 m)

On Wednesday, March 11, AVO conducted an overflight to Chiginagak Volcano which began exhibiting increased fumarolic activity last fall (see AVO Weekly Update 10/31/97). Although the summit was visible, a thin cloud layer obscured the fumarolic zones located between 5,500 - 6,500 feet (1676 - 1982 m).

continued

Bulbous gray-colored clouds were penetrating through the weather cloud layer at about 6,800 feet (2073 m) over the otherwise concealed location of the upper fumarolic zone. A strong sulfur smell was noticed 5 - 15 miles (16-49 km) downwind of the volcano. These observations, plus those from observers at Pilot Point 37 miles (60 km) northwest of the volcano, indicate that the vigorous fumarolic activity is continuing. However, this does not imply that an eruption is imminent.

Chiginagak Volcano is a 7005-ft-tall (2135 m) snow- and ice-covered symmetric stratovolcano. It is located 110 miles (175 km) south of King Salmon and 37 miles (60 km) southeast of Pilot Point on the Alaska Peninsula. Chiginagak is unmonitored by seismic instrumentation.

Other Volcanoes

Seismic activity is monitored in real time at 16 volcanoes in Alaska. Some of these volcanoes may currently display anomalous seismicity, but they are not considered to be at a dangerous level of unrest.

INFORMATION RELEASE 98-11 KAMCHATKAN VOLCANIC ACTIVITY

Monday, March 16, 1998, 7:30 PM KST (1930 UTC)

*Klyuchevskaya Group of Volcanoes:
Klyuchevskoy Volcano:*
56°03' N, 160°39' E; Elevation 4,750 m
**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

During the last week (March 10-15), seismicity under the volcano continued to be above background levels. During the week, a series of deep (25-30 km) earthquakes were recorded. On March 14, between 00:40 and 01:05 KST, surface earthquakes were recorded. On March 10, 13-15, the fumarolic plume rose 50-100 m above the volcano. On March 12 in the early morning, a gas and steam plume rose 200-1000 m above the volcano, moving more than 5 km to the east-southeast.

Sheveluch Volcano: 56°38' N, 161°19' E;
Elevation 2,800 m
**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

On March 13-15, a gas and steam plume rose 100 m above the volcano. Seismicity is about at background level.

Bezmianny Volcano: 55°58' N,
160°36' E
**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

On March 10, 12-14, a fumarolic plume rose 50-300 m above the volcano.

No seismicity was registered under the volcano.

Karymsky Volcano: 54°03' N, 159°27' E
**CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW**

Seismicity remains above background level. The low level strombolian eruptive activity that has characterized the volcano for more than two years continues. From 70 to 100 gas and ash explosions occurred every day.

Avachinskaya Group Of Volcanoes:
153°15' N, 158°51' E
**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

Seismicity at Avachinsky and Koryaksky volcanoes is at normal levels.

ALASKA VOLCANOES UPDATE

Friday, March 20, 1998 9:30 AM AST (1830 UTC)

Alaska Volcanoes:

Seismic activity is monitored in real time at 16 volcanoes in Alaska. Some of these volcanoes may currently display anomalous seismicity, but they are not considered to be at a dangerous level of unrest.

INFORMATION RELEASE 98-12 KAMCHATKAN VOLCANIC ACTIVITY

Monday, March 23, 1998, 9:40 AM KST (21:40 UTC)

*Klyuchevskaya Group of Volcanoes:
Klyuchevskoy Volcano:* 56°03' N,
160°39' E; Elevation 4,750 m
**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

During the last week (March 16-22), seismicity under the volcano continued to be above background levels. During the week, a series of deep (25-30 km) earthquakes were recorded. On March 16, 18-20, 22 the fumarolic plume rose 50-100 m above the volcano. On March 17, a gas and steam plume rose 2000-3000 m above the volcano, moving more than 5-10 km to the southeast.

Sheveluch Volcano: 56°38' N, 161°19' E;
Elevation 2,800 m
**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

On March 16-18, 22 a gas and steam plume rose 100-400 m above the volcano. Seismicity is above background level.

Bezmianny Volcano: 55°58' N,
160°36' E
**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

On March 16-20 and 22 a fumarolic plume rose 50-200 m above the volcano, moving 5-10 km to the south, south-east. No seismicity was registered under the volcano.

Karymsky Volcano: 54°03' N, 159°27' E
**CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW**

Seismicity remains above background level. The low level strombolian eruptive activity that has characterized the volcano for more than two years continues. From 70 to 100 gas and steam (sometimes with a few amount of volcanic ash) explosions occurred every day.

Avachinskaya Group Of Volcanoes:
153°15' N, 158°51' E
**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

Seismicity at Avachinsky and Koryaksky volcanoes is at normal levels.

ALASKA VOLCANOES UPDATE

Friday, March 27, 1998 1:00 PM AST (2200 UTC)

Volcano Lat. - Long. Elevation
Spurr 61°18' N 152°15' W
3374 m (11,070 ft)

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

Beginning at approximately 9:00 am AST on Thursday, March 26, an unusual cloud or steam plume in the vicinity of Spurr Volcano was observed from Anchorage. Seismicity at the volcano remains at normal background levels. Also, nothing unusual has been noted in satellite images of the volcano. Spurr Volcano is not considered to be at a dangerous level of unrest.

Spurr is a glacier-clad stratovolcano located 1130 km (81 mi) from Anchorage on the western side of Cook Inlet. Recent ash eruptions in 1953 and 1992 occurred from a flank vent called Crater Peak. Crater Peak is located 3.5 km (2.1 mi) south of the summit of Spurr and rises to an elevation of 2309 m (7576 ft).

Alaska Volcanoes:

Seismic activity is monitored in real time at 16 volcanoes in Alaska. Some of these volcanoes may currently display anomalous seismicity, but they are not considered to be at a dangerous level of unrest.

Redoubt, Iliamna, Augustine, Griggs, Katmai, Novarupta, Trident, Mageik, Martin, Pavlof, Dutton, Akutan, Shishaldin, Aniakhak, and Makushin volcanoes are all at or near normal levels of background seismicity.

INFORMATION RELEASE 98-13 KAMCHATKAN VOLCANIC ACTIVITY

Monday, March 30, 1998, 8:30 PM KST (19:30 UTC)

Klyuchevskaya Group of Volcanoes:

Klyuchevskoy Volcano: 56°03' N,
160°39' E; Elevation 4,750 m
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN
During the last week (March 23-29),
seismicity under the volcano
continued to be above back-
ground levels. During the week, a
series of deep (25-30 km)
earthquakes were recorded. On
March 23-28, the fumarolic plume
rose 50-200 m above the volcano,
moving more than 5-10 km to the
west-southwest.

Sheveluch Volcano: 56°38' N, 161°19'E;
Elevation 2,800 m
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN
On March 23-25 a gas and steam
plume rose 100-300 m above the
volcano; on other days, the
volcano was obscured by clouds.
Seismicity is about at background
level.

Bezymianny Volcano: 55°58'N,
160°36'E
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN
On March 23-24, a fumarolic plume
rose 50-300 m above the volcano,
moving 5-10 km to the south,
south-east. No seismicity was
registered under the volcano.

Karymsky Volcano: 54°03'N, 159°27'E
CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW
Seismicity remains above background
level. The low level strombolian
eruptive activity that has charac-
terized the volcano for more than
two years continues. From 70 to
100 gas and steam explosions
occur every day. KVERT visual
observations from an airplane (on
March 23 and 29) showed a gas
and steam plume with a small
amount of ash rising 200-400 m
above the volcano. Snow around
the volcano's cone was covered
by ash for a radius of 2-3 km.

Avachinskaya Group Of Volcanoes:
153°15'N, 158°51'E
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN
Seismicity at Avachinsky and
Koryaksky volcanoes is at normal
levels.

ALASKA VOLCANOES UPDATE

Friday, April 3, 1998
10:00 AM AST (1900 UTC)

Alaska Volcanoes:
Seismic activity is monitored in real
time at 16 volcanoes in Alaska.
Some of these volcanoes may
currently display anomalous
seismicity, but they are not
considered to be at a dangerous
level of unrest.

INFORMATION RELEASE 98-14
Kamchatkan Volcanic Activity
Monday, April 6, 1998, 8:30 PM KST
(19:30 UTC)

Klyuchevskaya Group of Volcanoes:
Klyuchevskoy Volcano: 56°03' N,
160°39' E; Elevation 4,750 m
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN
During the last week (March 30-April
5), seismicity under the volcano
continued to be above back-
ground levels. During the week, a
series of deep (25-30 km)
earthquakes were recorded. On
March 30-31, and April 1, 3, and 5,
the fumarolic plume rose 50-400
m above the volcano, moving 3-
10 km to the southeast.

Sheveluch Volcano: 56°38' N, 161°19'E;
Elevation 2,800 m
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN
On March 30-31 and April 1, 3, a gas
and steam plume rose 100-500 m
above the volcano; on other days,
the volcano was obscured by
clouds. Seismicity is about at
background level.

Bezymianny Volcano: 55°58'N,
160°36'E
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN
On March 30-31 and April 1-4, a
fumarolic plume rose 100-500 m
above the volcano. No seismicity
was registered under the volcano.

Karymsky Volcano: 54°03'N, 159°27'E
CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW
Seismicity remains above background
level. The low level strombolian
eruptive activity that has charac-
terized the volcano for more than
two years continues. From 70 to
100 gas and steam explosions
occur every day.

Avachinskaya Group of Volcanoes:
153°15'N, 158°51'E
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN
Seismicity at Avachinsky and
Koryaksky volcanoes is at normal
levels.

ALASKA VOLCANOES UPDATE
Friday, April 10, 1998 9:00 AM ADT
(1700 UTC)

Alaska Volcanoes:
Seismic activity is monitored in real
time at 16 volcanoes in Alaska.
Some of these volcanoes may
currently display anomalous
seismicity, but they are not
considered to be at a dangerous
level of unrest.

INFORMATION RELEASE 98-15
KAMCHATKAN VOLCANIC ACTIVITY
Monday, April 13, 1998, 8:30 PM KST
(19:30 UTC)

Klyuchevskaya Group of Volcanoes:

Klyuchevskoy Volcano: 56°03' N,
160°39' E; Elevation 4,750 m
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN
During the last week (April 6-12),
seismicity under the volcano
continued to be above back-
ground levels. During the week, a
series of deep (25-30 km)
earthquakes were recorded. On
April 6-9, 11-12, the fumarolic
plume rose 50-200 m above the
volcano, moving 5 km to the
southeast.

Sheveluch Volcano: 56°38' N, 161°19'E;
Elevation 2,800 m
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN
On April 9, 11-12, a gas and steam
plume rose 100-300 m above the
volcano. Seismicity is about at
background level.

Bezymianny Volcano:
55°58'N, 160°36'E
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN
On April 7-9, 11-12, a fumarolic plume
rose 100-300 m above the
volcano, moving 5 km to the
southeast. No seismicity was
registered under the volcano.

Karymsky Volcano: 54°03'N, 159°27'E
CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW
Seismicity remains above background
level. The low level strombolian
eruptive activity that has charac-
terized the volcano for more than
two years continues. From 70 to
100 gas and ash explosions occur
every day.

Avachinskaya Group of Volcanoes:
153°15'N, 158°51'E
CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN
Seismicity at Avachinsky and
Koryaksky volcanoes is at normal
levels.

ALASKA VOLCANOES UPDATE
Friday, April 17, 1998 11:00 AM ADT
(1900 UTC)

Alaska Volcanoes:
Seismic activity is monitored in real
time at 16 volcanoes in Alaska.
Some of these volcanoes may
currently display anomalous
seismicity, but they are not
considered to be at a dangerous
level of unrest.

INFORMATION RELEASE 98-16
KAMCHATKAN VOLCANIC ACTIVITY
Monday, April 20, 1998, 5:20 PM KDT
(4:20 UTC)

Klyuchevskaya Group of Volcanoes:
Klyuchevskoy Volcano:
56°03' N, 160°39' E; Elevation 4,750 m
CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW

continued

During the last week (April 12-19), seismicity under the volcano continued to be above background levels. During the week, deep (25-30 km) earthquakes were recorded. On April 17 at 16:08, a series of shallow earthquakes with magnitudes up to M=2 began to be recorded. On April 12-16, a fumarolic plume rose 50-100 m above the volcano, moving 3-5 km to the southeast. On April 18, no fumarolic activity was observed.

Sheveluch Volcano: 56°38'N, 161°19'E;
Elevation 2,800 m

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

On April 9, 12-19, a gas and steam plume rose 50-300 m above the volcano.

Seismicity is about at background level.

Bezymianny Volcano:
55° 58'N, 160°36'E

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

On April 12-16, and 19, a fumarolic plume rose 50-100 m above the volcano, moving 5 km to the southeast on April 12. No seismicity was registered under the volcano.

Karymsky Volcano:
54°03'N, 159°27'E

**CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW**

Seismicity remains above background level. The low level strombolian eruptive activity that has characterized the volcano for more than two years continues. About 200 gas and ash explosions occur every day. Satellite images received by AVO indicate a long thin steam plume extending for >100 km from the volcano on April 17, and a distinct thermal anomaly well above background (pixel temperatures of ~40 degrees C) at the summit on April 18. This thermal anomaly may indicate a small renewal of lava effusion.

Avachinskaya Group of Volcanoes:
153°15'N, 158°51'E

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

Seismicity at Avachinsky and Koryaksky volcanoes is at normal levels.

ALASKA VOLCANOES UPDATE

Friday, April 24, 1998 9:30 AM ADT
(1730 UTC)

Alaska Volcanoes:

Seismic activity is monitored in real time at 16 volcanoes in Alaska. Some of these volcanoes may currently display anomalous seismicity, but they are not

considered to be at a dangerous level of unrest.

INFORMATION RELEASE 98-17 KAMCHATKAN VOLCANIC ACTIVITY Monday, April 27, 1998, 5:50 PM KDT (4:50 UTC)

*Klyuchevskaya Group of Volcanoes:
Klyuchevskoy Volcano:*
56°03' N, 160°39' E Elevation 4,750 m
CURRENT LEVEL OF CONCERN

COLOR CODE IS YELLOW

During the last week (April 20-26), seismicity under the volcano continued to be above background levels and deep (25-30 km) earthquakes were recorded.

On April 22, a 10-minute series of strong explosive earthquakes were recorded up to 70 km from the volcano. Clouds have obscured the volcano for much of the week. On April 24 and 26, the fumarolic plume rose 50-500 m above the volcano.

Sheveluch Volcano: 56°38' N, 161°19'E;
Elevation 2,800 m

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

On April 25, no fumarolic plume was visible. Seismicity is about at background level although on April 22-23, the high-frequency volcanic tremor was registered.

Bezymianny Volcano:

55° 58'N, 160°36'E

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

On April 24 and 26, a fumarolic plume rose 50-100 m above the volcano. No seismicity was registered under the volcano.

Karymsky Volcano:

54°03'N, 159°27'E

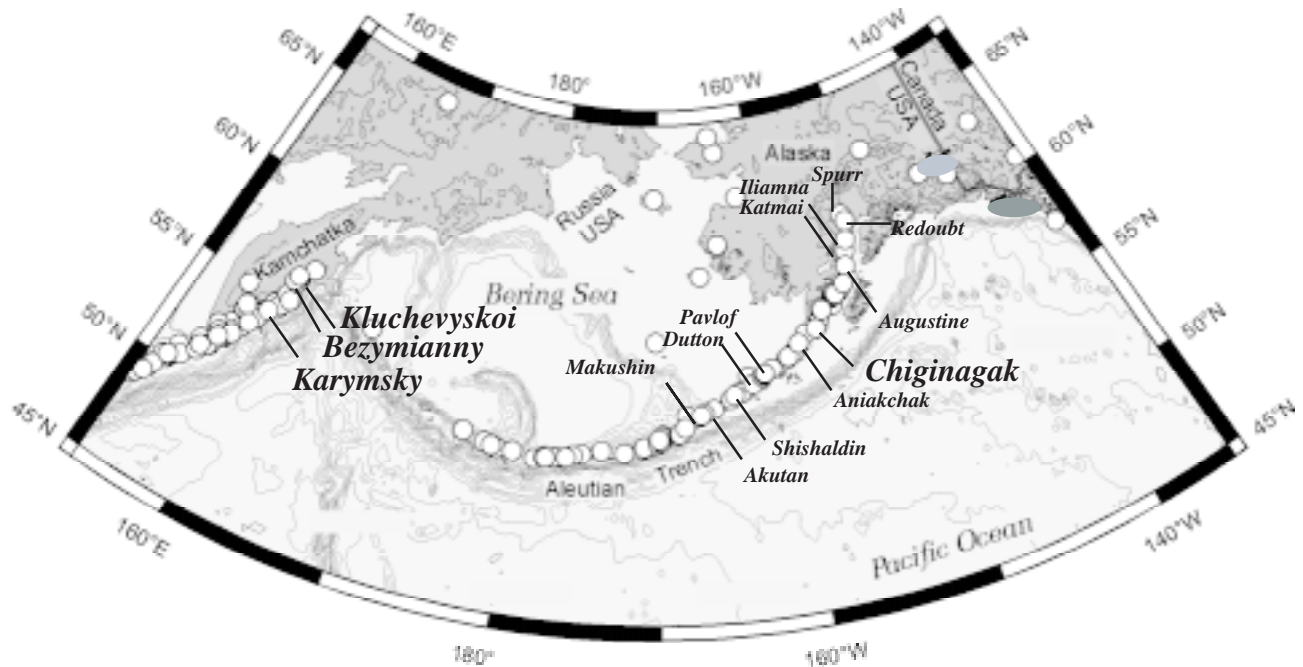
**CURRENT LEVEL OF CONCERN
COLOR CODE IS YELLOW**

Seismicity remains above background level. The low level strombolian eruptive activity that has characterized the volcano for more than two years continues. About 100 earthquakes and gas explosions occur every day. Deeper events predominate over explosive events.

Avachinskaya Group of Volcanoes:
153°15'N, 158°51'E

**CURRENT LEVEL OF CONCERN
COLOR CODE IS GREEN**

Seismicity at Avachinsky and Koryaksky volcanoes is at normal levels.



Map showing Alaska Peninsula, Aleutian arc and Kamchatka Peninsula and subregions of study. White circles are volcanoes. Names are given for all monitored volcanoes. Names in large font denote volcanoes discussed in this report with visible changes in activity.

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